

ECONOMIC UTILIZATION OF OCEAN RESOURCES

Background

Economic as well as biological factors affect the utilization of California's living marine resources. A particularly notable economic phenomenon has been the increase in trade activity between the domestic seafood industry and its foreign counterparts. California's commercial landings are increasingly being marketed abroad, and California consumers are satisfying their cosmopolitan taste for seafood with an array of imported products.

The economic value of a commercial fishery is appropriately measured by the benefits that it provides to consumers and the net economic return (gross revenue minus costs) that it generates to businesses at the ex-vessel, wholesale and retail levels. This chapter's discussion of commercial landings considers only the ex-vessel component of value, and reflects gross rather than net economic return in that it ignores the cost of harvesting fish. Similarly, the discussion of seafood imports and exports includes only the wholesale component of value and ignores costs incurred by import/export businesses. These ex-vessel and wholesale values provide a useful but incomplete picture of the economic value of California's commercial fisheries.

All monetary estimates of value provided in this chapter have been corrected for inflation and are expressed in 1990-equivalent dollars.

Supply

Trends in Landings and Revenues. Seasonal and annual variations in commercial landings are affected by a variety of factors, including species abundance and availability, management restrictions, market demand, ex-vessel prices, harvesting and processing technology and weather. The picture is further complicated by the multispecies nature of many fishing operations (For instance, small combination boats target salmon and albacore with troll gear and crab with pot gear, round haul vessels target pelagic wetfishes, squid, bonito and bluefin tuna; trawlers target rockfish, sablefish, Pacific whiting, flatfish and shrimp). In multispecies fisheries, fishing strategies, and therefore, landings of each species are affected by the availability and profitability of all species targeted in the fishery. Trends in landings are properly viewed in the context of these contributing factors and the interactions among them.

The State of California requires poundage landed, price received, and other information, to be recorded on a "pink ticket" each time a commercial fishing vessel lands its catch at a California port. The landings described in this chapter are based on pink ticket data and reflect most of the harvest but exclude discards, live bait catch and capture of live specimens for aquarium use. In particular:

1) Commercial fishing operations often yield a bycatch of non-targeted species, which may be landed and sold or discarded at sea. Even targeted species may be discarded if, for instance, they are sub-legal or non-marketable in size, or part of a catch that exceeds a trip limit. Information on the level of discards and discard mortality is generally unavailable.

2) Live bait sold in the recreational fishery is generally not landed, since transactions between buyers and sellers of live bait take place at sea or from receivers that are tied up near the docks. Logbook data indicate that bait haulers harvest up to twelve million pounds of live bait per year, most of which consists of northern anchovy.

3) A variety of marine specimens are harvested live, for display in home and public aquariums. These include animals such as gobies, juvenile sheepshead, juvenile leopard shark, and even "live rocks" (pieces of substrate with attached communities of living organisms). The harvest of such specimens, though not recorded on pink tickets, has likely increased in recent years, due to increases in domestic and foreign demand.

Total finfish and shellfish landings in California declined by almost half from 1970 to 1990, while total U.S. landings doubled over the same period. California's share of the U.S. harvest, which was 14 percent in 1970, declined to four percent by 1990. Ex-vessel revenues followed a similar pattern (Table 1).

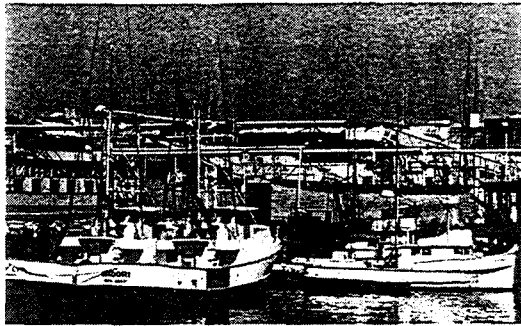
Table 1. Commercial landings (1,000 lbs. landed weight) and ex-vessel revenues (\$1,000's) in 1990-equivalent dollars of finfish and shellfish in California and the United States in 1970, 1975, 1980, 1985 and 1990.

Year	Landings (1,000 pounds)	
	California	United States
1970	703,216	4,917,220
1975	861,315	4,877,443
1980	800,723	6,482,354
1985	356,960	6,257,642
1990	395,753	9,708,421

Year	Ex-Vessel Revenues (\$1,000's)	
	California	United States
1970	290,551	2,065,417
1975	307,900	2,372,577
1980	501,121	3,548,572
1985	154,002	2,825,643
1990	158,851	3,572,437

The major reason for California's diminished profile was the nine-fold decline in tuna landings from 1970 to 1990 (see appendix for landings figures). The proportion of ex-vessel revenues from all species attributable to tuna decreased from 74 percent in 1970 to 17 percent in 1990 (Table 2). High interest rates, the relocation of tuna processing operations from California to American Samoa and Puerto Rico, and competition from imports of canned tuna packed in water created economic hardship for the fishing fleet. Tuna landings in California dropped precipitously as many of the superseiners transferred flags or converted to other fisheries.

In 1970, California's top revenue-generating species were yellowfin (\$141.1 million), skipjack (\$40.7 million) and albacore (\$26.4 million); together, these three tunas accounted for 72 percent of total revenues from all species. By 1990, the top revenue-generating species had become sea urchin (\$24.7 million), yellowfin tuna (\$19.7 million), rockfishes (\$16.9 million), Dungeness crab (\$16.3 million) and chinook salmon (\$11.3 million), together accounting for 56 percent of total revenues from all species. California's commercial fishing industry, once dominated by the tuna fishery, has evolved into a more heterogeneous mix of smaller fisheries.



Commercial fishing vessel at San Pedro.

In addition to the tuna fishery, a number of other fisheries have also experienced a decline in recent years. For instance, both biological and economic factors (e.g., habitat loss, competition from aquaculture) have contributed to the decline in salmon landings. Concerns about abalone stocks have prompted increasingly restrictive management measures to reduce fishing effort, and abalone harvest has declined despite a strong market. Anchovy landings have fallen dramatically since 1983, when the decline in the ex-vessel reduction price prompted the round haul fleet to redirect their fishing effort to higher-priced species such as mackerel and squid.

Landings and ex-vessel revenues attributable to species other than tuna increased from \$74.7 million in 1970 to \$131.9 million in 1990, indicating that declining harvests of some species have been more than offset by increases in others. For instance, mackerel landings increased dramatically in the late 1970's, when the Pacific mackerel population rebounded to levels of abundance not experienced since the early 1940's. Market demand for calamari has prompted the upward trend in squid landings, which reached a record high of 62.7 million pounds in 1990.

A number of major fisheries in California are driven by market demand in the Pacific Rim. For instance, the fishery for red sea urchins developed in the early 1970's, when California gained access to the Japanese market for "uni" (sea urchin gonads, also referred to as roe for marketing purposes). Currently, about 50 percent of all urchin roe imported by Japan originates in the U.S. and over 75 percent of the U.S. product originates in California. In addition to being marketed fresh in Japan, California uni is also sold in the growing domestic sushi market.

Pacific herring landings also increased significantly during the 1970's, as California fishermen obtained access to Asian

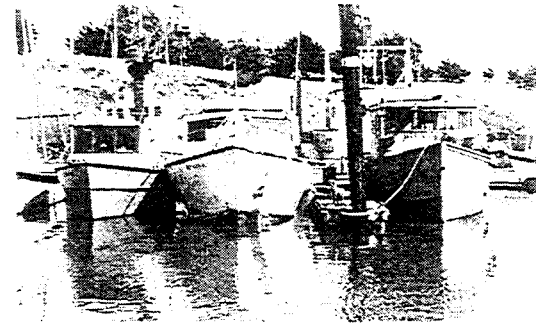


Market squid (*Loligo opalescens*) gathered under lights at night.

markets. The harvest is shipped frozen to South Korea, where the roe is stripped and sold as a delicacy in Japan. Although prices have declined and stabilized from the record high of 1980, the fishery generates higher ex-vessel revenues than any other pelagic wetfish species.

The expansion of California's groundfish fishery during the 1970's was fueled by expanding markets as well as improvements in harvesting and processing technology. Asia is the major market for thornyheads, sablefish and other groundfish species.

Many of California's fledgling fisheries are also driven by Asian markets. The hagfish fishery developed in response to a hagfish shortage in the Republic of Korea, where the meat is eaten and the skin made into leather goods. Herring roe on kelp is packed in brine on kelp fronds and marketed as a delicacy in Japan. Landings of sea cucumber (boiled, dried and salted for sale in foreign and domestic Asian markets) doubled between 1985 and 1990. An experimental fishery has recently developed for purple sea urchins for both the roe and live sea urchin markets in Japan. Live fish markets that cater to California's own Asian population have developed for spot prawns, cabezon, California sheephead, white croaker and other small fishes.



Part of the commercial fishing fleet owned by immigrant families from Vietnam at Moss Landing harbor.

A fishery which has been virtually inactive during 1970-1990, but has perhaps the greatest potential for development, is

Pacific sardine. During the heyday of the sardine fishery (1934-1945), California landings averaged 1.1 billion pounds per year and accounted for almost 80 percent of total statewide landings of all species. The late 1940's signalled the beginning of what was to be a long term collapse of the fishery. Subsequent State restrictions on sardine harvest culminated in 1974 with a moratorium on all directed harvest and a small allowance for

incidental take. The State lifted its moratorium in 1986 and currently allows modest levels of directed and incidental harvest. Once sufficiently recovered, the sardine population may be able to sustain an annual yield of 500 million pounds. Whether and when this actually occurs will depend on the timetable for recovery of the stock and development of markets for sardine products, both of which are highly uncertain at this time.

Table 2. Ex-vessel revenues (in 1990-equivalent dollars) from finfish and shellfish in California in 1970, 1975, 1980, 1985 and 1990, by species category (\$1,000's).

Species	1970	1975	1980	1985	1990
CRUSTACEANS					
Dungeness Crab	13,432.5	6,781.6	15,496.8	10,844.0	16,273.8
Pac. Ocean Shrimp	1,910.6	1,615.5	3,464.8	1,442.2	4,184.1
Spiny Lobster	903.8	1,042.9	2,140.2	2,362.0	3,962.3
Rock Crab	201.1	642.6	1,219.1	1,867.2	1,813.9
Spot Prawn	55.2	488.8	718.8	401.0	1,526.0
Bay Shrimp	3.7	6.8	0.0	0.0	489.5
Ridgeback Prawn	0.0	38.9	321.8	669.0	152.5
Other	0.0	82.4	19.2	85.5	347.6
Total	16,506.9	10,699.5	23,380.7	17,670.9	28,749.7
TUNA					
Yellowfin	141,099.4	149,560.2	178,485.0	18,061.6	19,719.9
Bonito	2,194.3	9,463.6	4,511.5	712.3	1,934.8
Albacore	26,428.3	12,237.9	15,156.0	8,997.7	1,794.9
Bluefin	5,375.5	9,753.4	5,185.3	3,576.3	1,786.2
Skipjack	40,703.3	41,480.0	145,883.7	2,335.1	1,676.4
Other	11.5	291.8	2,055.2	1,102.1	83.7
Total	215,812.3	222,786.9	351,276.7	34,785.1	26,995.9
ECHINODERMS					
Sea Urchin	0.0	1,493.1	5,813.5	5,876.3	24,714.8
Other	0.0	0.0	8.6	18.3	35.9
Total	0.0	1,493.1	5,822.1	5,894.6	24,750.7
ROUND FISH					
Rockfish:					
Thornyhead	0.0	0.0	1,228.0	1,971.7	4,575.0
Sculpin	156.3	172.7	80.9	37.2	165.9
Other	2,777.4	7,808.5	12,302.9	12,991.4	12,199.9
Subtotal	2,933.7	7,981.2	13,611.8	15,000.3	16,940.8
Sablefish	1,075.6	3,401.1	2,781.8	3,432.1	3,487.2
Pacific Whiting	0.7	4.9	172.7	479.4	777.7
Total	4,010.0	11,387.2	16,566.3	18,911.8	21,205.7
PELAGIC WET FISH					
Pacific Herring	124.0	533.7	26,514.7	7,325.2	7,014.0
Mackerel	6,503.3	4,149.8	15,440.4	9,511.5	5,775.8
Northern Anchovy	7,266.7	12,166.3	4,039.5	338.8	604.1
Pacific Sardine	341.2	0.7	6.7	1.7	178.6
Total	14,235.2	16,850.5	46,001.3	17,177.2	13,572.5
SALMON					
Chinook	N/A	N/A	N/A	N/A	11,299.7
Coho	N/A	N/A	N/A	N/A	621.4
Other	N/A	N/A	N/A	N/A	125.2
Total	17,183.7	16,936.6	21,233.4	14,239.9	12,046.3
FLAT FISH					
Dover Sole	4,153.4	6,090.4	5,803.6	7,651.9	3,681.7
California Halibut	307.2	870.7	1,636.6	2,777.6	2,126.7
Petrale Sole	1,788.7	1,902.9	1,692.4	1,694.5	1,220.6
English Sole	1,090.4	1,936.7	2,125.0	970.9	682.6
Sanddab	236.8	459.2	665.4	449.2	437.0
Rex Sole	639.4	739.3	1,006.6	860.1	428.3
Sand Sole	78.2	94.0	217.5	217.8	156.7
Other	77.5	254.1	390.8	261.8	95.4
Total	8,371.6	12,347.3	13,537.9	14,883.8	8,829.0

Table 2. (continued)

Species	1970	1975	1980	1985	1990
MOLLUSKS					
Market Squid	2,245.8	2,007.9	4,812.9	4,517.9	4,683.7
Abalone:					
Red	N/A	1,415.6	1,622.8	1,545.0	1,845.9
Black	N/A	555.1	971.7	956.2	381.1
Green	N/A	331.4	223.0	124.9	178.9
Pink	N/A	908.6	461.3	314.1	140.0
Other	N/A	165.4	8.4	16.2	1.9
Subtotal	3,191.7	3,376.1	3,287.2	2,956.4	2,547.8
Other	3,528.6	2,700.7	1,962.7	176.1	58.0
Total	8,966.1	8,084.7	10,062.8	7,650.4	7,289.5
SWORDFISH	1,798.8	3,392.9	4,983.4	16,336.3	7,140.0
NEARSHORE FISHES					
Lingcod	467.2	1,025.2	1,046.9	555.2	931.2
Calif. Sheephead	1.3	2.7	5.2	22.8	456.4
White Croaker	150.2	226.4	484.3	639.2	341.2
White Seabass	1,300.9	1,613.3	1,903.6	294.6	287.0
Other	400.2	357.4	587.8	431.0	300.9
Total	2,319.8	3,225.0	4,027.8	1,942.8	2,316.7
HAGFISH	0.0	0.0	0.0	0.0	2,118.2
SHARKS/RAYS/SKATES					
Mako Shark	N/A	N/A	157.8	234.7	741.8
Common Thresher Shark	N/A	N/A	1,960.2	2,200.5	641.3
Pacific Angel Shark	N/A	N/A	47.3	700.9	164.7
Southern Shark	N/A	N/A	126.7	257.6	102.7
Other	N/A	N/A	1,307.6	298.4	155.6
Total	182.9	318.5	3,599.6	3,692.1	1,806.1
HERRING ROE ON KELP SMELTS	0.0 269.1	0.0 201.6	0.0 226.2	0.0 310.0	1,525.4 235.0
SUBTOTAL	289,656.4	307,723.8	500,718.2	153,494.9	158,580.7
OTHER	894.1	175.8	403.2	506.6	270.6
GRAND TOTAL	290,550.5	307,899.6	501,121.4	154,001.5	158,851.3

Imports and Exports. The U.S. has experienced a persistent trade deficit with regard to seafood products. The value of U.S. imports of edible fishery products more than doubled from \$2.4 billion in 1970 to \$5.2 billion in 1990. Exports, although significantly lower in value than imports, increased almost tenfold from \$0.3 billion in 1970 to \$2.8 billion in 1990 (Table 3).

California's seafood trade deficit is disproportionately large. In 1990, the value of imported seafood products exceeded the value of exported products by two to one for the U.S. as a whole (Table 4) and by almost eight to one for California (Tables 5 and 6). About 28 percent (\$1.5 billion) of the imported value of fishery products in 1990 entered the U.S. at a California port. By comparison, California's share of U.S. exports in 1990 was a relatively modest seven percent (\$0.2 billion).

The past two decades have seen the development of a global market for fishery products and the increasing prominence of Pacific Rim countries as trading partners. Whereas 29 percent of the value of U.S. exports involved trade with Asia in 1970, this proportion had increased to 71 percent by 1990 (Table 3). Our major trading partners in 1990 were Japan (\$1,785.9 million) and Canada (\$313.6 million). The import picture is more diverse. In

1990, Asia and North America each accounted for about one-third of the value of U.S. imports (Table 3). More than half of U.S. imports in 1990 originated from the following five countries: Canada (\$1,174.5 million), Thailand (\$592.2 million), China (\$399.4 million), Ecuador (\$340.6 million) and Mexico (\$278.9 million).

The species composition of imports and exports differs somewhat between California and the U.S. as a whole. Shrimp accounted for 52 percent of the value of foreign imports into California (Table 4) and 31 percent of imports into the U.S. (Table 6) in 1990. Fresh and frozen salmon accounted for percent of the total value of U.S. exports (Table 6) but only four percent of the value of California's exports (Table 5). Fresh sea urchin was California's major exported product in 1990, accounting for 23 percent of the value of all seafood exported from the State (Table 5).

The seafood industry in California has created business opportunities for numerous processors, importers, brokers, traders and distributors. While the import/export figures (Tables 4 and 5) are indicative of the size of the seafood market in California, the complex and circuitous interactions among

middlemen make it difficult to trace imports and exports to their final destination. Imports are not necessarily consumed in the state of entry. For instance, some seafood imports that enter the U.S. at Nogales, Arizona and Honolulu, Hawaii likely end up in California markets. In addition, it is not safe to assume that exports from a state were necessarily produced within that state. For instance, much of the abalone exported from California is harvested in Mexico and funneled to other countries via California.

Despite the difficulty of determining exactly how much of the seafood imported into the U.S. ends up in California markets, available information suggests that Californians rely heavily on imports to satisfy their substantial demand for seafood. By one estimate, less than 10 percent of the seafood sold in California is derived from California fisheries; 13 percent comes from Pacific Northwest and Alaska fisheries, and most of the remainder consists of foreign imports.

Table 3. Value in 1990-equivalent dollars of U.S. imports/exports of edible fishery products by continent of origin/destination in 1970, 1975, 1980, 1985 and 1990 (\$1,000's).

IMPORTS FROM:	1970	1975	1980	1985	1990
Asia	587,756	696,697	993,671	1,374,528	1,954,106
North America	971,795	1,391,666	1,798,200	1,732,183	1,729,076
South America	220,344	312,849	474,884	707,176	764,016
Europe	304,309	614,229	612,851	762,636	487,013
Australia	183,455	160,851	258,673	274,233	262,376
Africa	106,531	145,092	116,266	86,141	36,578
TOTAL	2,374,190	3,321,384	4,254,545	4,936,897	5,233,165
EXPORTS TO:	1970	1975	1980	1985	1990
Asia	85,140	190,190	706,158	881,539	1,983,666
Europe	112,769	263,625	393,907	150,043	425,523
North America	86,077	185,623	273,014	166,517	343,980
Australia	4,409	7,196	37,318	25,392	20,493
Africa	1,283	1,482	10,551	1,794	3,611
South America	1,614	1,399	13,522	1,872	2,177
TOTAL	291,292	649,515	1,434,470	1,227,157	2,779,450

Table 4. Value of 20 top imports of edible fish and fish products into California from foreign countries in 1990 (\$1,000's).¹

Product Category	Value
Shrimp, frozen	774,940
Misc., frozen	129,912
Lobster, frozen	91,178
Tuna, canned	76,547
Tuna, prepared	64,387
Mollusk, frozen	45,299
Abalone, prepared	35,209
Misc., fresh	23,377
Mollusk, live	19,291
Shrimp, canned	18,263
Squid, frozen	15,770
Oyster, canned	14,828
Crab, canned	13,667
Sardine, prepared	13,003
Tuna, fresh	11,941
Misc., prepared	10,799
Salmon, fresh	10,524
Crab, frozen	8,880
Clams, canned	7,724
Crustacean, frozen	7,715
Other	97,746
TOTAL	1,491,000

¹Source: Unpublished data from U.S. Bureau of the Census.

Table 5. Value of 20 top exports of edible fish and fish products from California to foreign countries in 1990 (\$1,000's).¹

Product Category	Value
Sea urchin, fresh	44,436
Abalone, prepared	30,392
Misc., frozen	15,750
Cod, frozen	11,235
Roe, frozen	9,695
Lobster, frozen	9,383
Shrimp, frozen	7,344
Misc., dried	7,257
Squid, frozen	6,793
Herring, frozen	6,726
Salmon, frozen	5,928
Squid, prepared	4,772
Tuna, fresh	3,012
Clams, frozen	2,263
Mollusk, prepared	2,175
Salmon, canned	1,900
Crab, frozen	1,868
Salmon, fresh	1,855
Shrimp, canned	1,491
Sablefish, frozen	1,470
Other	17,255
TOTAL	193,000

¹Source: Unpublished data from U.S. Bureau of the Census.

Table 6. Value of U.S. exports, imports and net exports of fishery products in 1990, by product category (\$1,000's).

Product Category	Exports	Imports	Net Exports
FRESH & FROZEN:			
Shrimp	112,212	1,639,181	-1,526,969
Fillets	66,320	809,932	-743,612
Lobster	82,622	439,972	-357,350
Tuna	45,085	339,300	-294,215
Blocks	214,679	373,292	-158,613
Scallop	19,518	130,453	-110,935
Groundfish ¹	298,568	79,987	218,581
Salmon	666,583	252,880	413,703
Other Fish and Shellfish	814,885	456,311	358,574
Total	2,320,472	4,521,308	-2,200,836
CANNED:			
Salmon	104,277	4,241	100,036
Tuna	13,211	293,873	-280,662
Other	68,140	244,510	-176,370
Total	185,628	542,624	-356,996
CAVIAR & ROE	223,836	15,007	208,829
CURED	32,831	118,581	-85,750
OTHER	16,683	35,645	-18,962
GRAND TOTAL	2,779,450	5,233,165	-2,453,715

¹"Groundfish" includes all fresh and frozen product forms (except fillets and blocks) of cod, haddock, hake, pollock, sablefish and flatfish. "Fillets" and "Blocks" cover a variety of species, including groundfish.

Demand

During 1986-1988, U.S. consumption of fish and shellfish averaged 45.2 pounds per capita (live weight equivalent). Similar consumption rates can be found in Western Europe and Canada. Consumption rates in northern Europe and industrialized Asian countries are two to four times the U.S. average, while consumption rates in Mexico and other less industrialized countries tend to fall below the U.S. average (Table 7).

Consumption of commercial finfish and shellfish in the U.S. (edible meat) increased from about 24.0 billion pounds in 1970 to 38.8 billion pounds in 1990. The reasons for this are twofold: a 23 percent increase in the U.S. population and a 31 percent increase in per capita consumption, from 11.8 pounds in 1970 to 15.5 pounds in 1990. About two-thirds of total consumption is accounted for by fresh and frozen products (Table 8).

Assuming that per capita seafood consumption in California is equal to the national averages described in Table 8, total consumption in California (edible meat) is estimated to have increased from approximately 2.4 billion pounds in 1970 to 4.5 billion pounds in 1990. These, however, should be considered conservative estimates, since the strong seafood preferences exhibited by sizeable segments of California's population (e.g., upscale health-conscious consumers, Asian immigrants) suggest that per capita consumption in California likely exceeds the national average.

Table 7. Annual per capita consumption of fish and shellfish in selected countries, 1986-88 average (pounds live weight equivalent).

Country	Pounds Live Weight
Iceland	203.7
Japan	157.0
Portugal	132.5
Hong Kong	112.2
Republic of Korea	109.3
Norway	97.7
Spain	83.8
France	63.9
Canada	59.3
Peru	51.4
United States	45.2
United Kingdom	42.3
German Democratic Republic	33.5
Mexico	21.6
People's Republic of China	17.6
Brazil	14.6

Table 8. U.S. annual per capita consumption of commercial fish and shellfish by product category in 1970, 1975, 1980, 1985 and 1990 (pounds edible meat).

Product Category	1970	1975	1980	1985	1990
Fresh and Frozen	6.9	7.5	7.9	9.8	10.1
Canned	4.5	4.3	4.3	5.0	5.1
Cured	0.4	0.4	0.3	0.3	0.3
TOTAL	11.8	12.2	12.5	15.1	15.5

Outlook

California's commercial fishing industry, once dominated by the tuna fishery, has evolved into a more heterogeneous mix of smaller fisheries. Many of these fisheries have developed in response to demand in Pacific Rim countries (most notably Japan). Future fishery development in the State will depend largely on the ability of the industry to compete in the global seafood market. This ability will depend, not only on the quantity and quality of domestically caught seafood, but also on success in overcoming barriers to trade.



The dory fleet at Newport Beach where fishermen have marketed their catch directly to consumers for many decades.

Commercially caught seafood must also compete with aquaculture products for the consumer's dollar. Aquaculture contributes significantly to the worldwide trade in seafood products. While the competition offered by farm-raised imports (particularly salmon and shrimp) probably reduces the ex-vessel prices received by U.S. fishermen, it also provides benefits to U.S. consumers in the form of lower seafood prices.

In addition to market pressures, California's commercial fisheries face growing competition from other users, including sport anglers and marine mammals (most notably sea otters and sea lions), for limited marine resources. Activities that alter the marine environment (such as oil and gas development, discharge of sewage, thermal and chemical wastes, diversion of water from instream to agricultural and

other uses, dredging of harbors, elimination of wetlands, and other forms of coastal development) also affect the abundance of marine resources.

Seafood safety is also an important health and economic issue. Quality control from harvest to market, and adequate inspection, provide important safeguards. However, even isolated instances of tainted seafood can erode consumer confidence, with significant repercussions for the entire industry.

Cynthia Thomson
National Marine Fisheries Service

John Dentler
National Marine Fisheries Service